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CONGENITALLY IMPERFORATE RECTUM

WITH A WELL-FORMED ANUS,

IN AN INFANT AT TERM; RESTORATION OF THE ANAL
OUTLET (PROCTOPLASTY) AFTER KRASKE'S OPERATION.
CONVALESCENCE COMPLICATED BY WHOOPING-COUGH
AND PROCIDENTIA OF THE RECTUM NECESSITATING
EXCISION. RECOVERY WITH PARTIAL CONTROL OF
BOWEL.

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On the morning of August 28, 1894, I delivered Mrs. H. W.,
et. 23, III-para, at term, of an apparently full grown male
infant.* The delivery was affected without difficulty. As the
child had an entirely normal appearance, no minute examination
was made. The anus was well formed and the genitals pre-
sented no abnormality on inspection. The next morning I was
informed by the nurse in charge that though the baby had
urinated freely, it had failed to pass meconium notwithstanding
that it had taken the breast. As the external appearance of the
anus was normal, I paid no special attention to these parts and
advised that the baby be encouraged to take the breast, and, if
there was no movement of the bowels by evening to administer
two teaspoonfuls of sweet oil by enema. In the evening the
nurse reported that notwithstanding repeated attempts, she had
completely failed to inject the rectum, the enema being rejected
as fast as it was injected; further, the child had grown restless,

* It will be well to note, at this point, that Mrs. H. W. is of distinctly tubercular antecedents on her maternal side, her mother having died with pulmonary tuberculosis. The husband, and father of the child, is distinctly tubercular, with cavities in both lungs. These facts may have some relationship with the existing imperfections in the child.

cried frequently, and the abdomen was more tense and full than usual. I immediately examined the rectum and found that a probe could be made to enter the anus a distance of three-quarters of an inch from the anal margin and no further. The little finger introduced into the anus revealed a complete membranous barrier, and confirmed the existence of an imperforate anal *cul de sac*. It was evident, therefore, that the proctodeum had been fully developed, but had failed to meet the mesenteron or rectal *cul de sac*, and that the distance separating the two remained, as usual, an unknown quantity that could only be ascertained by puncture or open section.

The serious nature of the case was fully explained to the parents and an operation urged that would permit the establishment of an outlet through the normal anus or perineum or of an artificial anus elsewhere, if the exploration of the pelvis revealed such a condition that made the restoration of the intestinal canal at the anal region an impossibility. The parents at once consented. The general condition of the baby was excellent. The abdomen though slightly full and tense did not give evidence of intestinal paresis. The stomach retained a few teaspoonfuls of sweetened water without vomiting.

At 11 P. M., forty hours after the birth of the baby, and with the valuable assistance of my friend, Dr. P. Michinard, and of Miss Little, trained nurse, the operation was begun. No anesthetic was given. The parts were carefully prepared by a general warm bath, potash soap, and local compresses of warm carbolic solution (2½ per cent.). The limbs were carefully wrapped in cotton and flannels to retain heat and prevent shock by exposure. Notwithstanding the late hour (11 P. M.) sufficient light was obtained by several lamps, so that no difficulty was experienced in the way of illumination. The infant was first placed on the back with the nates raised high, the thighs flexed and projecting beyond the edge of a hard pillow in an exaggerated lithotomy position.

An attempt was first made to determine the depth of the rectal pouch by introducing a long needle, attached to an aspirating syringe, in the direction of the hollow of the sacrum and upward. This was introduced a considerable depth, over two inches, by penetrating the rectal *cul de sac*, which, it must be stated, was not tense or bulged when the child cried. After repeating the

exploration with negative results, the formal perineal section was begun.

A grooved director was then introduced into the anus as far as it would go without perforating the *cul de sac*, and an incision was made in the median line through the posterior anal margin to the coccyx. As nothing appeared in the wound at this stage of the operation which could suggest the appearance of the rectal pouch, the incision was carried higher up to the base of the coccyx in the middle line, and the coccyx, which was cartilaginous, was easily excised, by enucleation, without much disturbance to the soft parts. The removal of the coccyx left an opening which readily admitted the little finger for its whole length into the pelvis and greatly facilitated exploration. The lips of the wound and nates were now fully retracted and careful search made for the missing rectal pouch by dissecting the loose retro-peritoneal connective tissue. After this, a dark, brownish green, soft mass was indistinctly recognized as the occluded rectal pouch. An attempt was now made to seize this mass with hemostatic forceps and to drag it down to the edge of the perineo-coccygeal wound. As this opening was insufficient and it was evident that any forcible attempts at traction upon the mesenteron would end in a premature rupture of the gut and an inability to form a proper artificial anus, I decided to remove as much of the sacrum as would be required to permit of more direct exposure of the pelvic contents and permit the easy introduction of the finger or instruments into the pelvic cavity, with the view of clearing the high rectal end of its attachments, thus permitting me to drag it down to a safe anchorage at the sacral outlet.

To resect the sacrum was a very simple procedure, as the bone was still cartilaginous and could be cut through with strong, blunt-pointed scissors with less difficulty than would be experienced in cutting through heavy card board. With a few clips of the scissors a considerable fragment of the sacrum was removed up to a point corresponding with the highest level of the fourth sacral vertebra. The sacral excision was central at the coccygeal line, but became marginal and to the left as it advanced upward. A fenestrum was thus made in the posterior wall of the pelvis which permitted an easy exposure of the missing bowel and peritoneum. By gently insinuating the index

between the anterior surface of the sacrum and the tissues in front of it, the rectal pouch was sufficiently mobilized to permit it to appear at the sacro-coccygeal opening without dangerous traction. The peritoneum almost completely surrounded the gut, which presented a distended sausage-like appearance, of a dark bluish-black color. The peritoneal covering was particularly adherent at the lower end of the pouch, and here the serosa was unavoidably torn by my manipulations. The rent in the peritoneum was, however, easily closed by a few catgut stitches, before the small intestines had opportunity to prolapse through the opening. It was now recognized that the gap between the anus and rectum was considerable, and that there was no sign of the distinct cord that, according to some observers, sometimes connects the rectal and anal ends and represents the obliterated rectal portion.

The dilated anal extremity of the mesenteron was now gently pulled down until it projected beyond the edges of the wound, and after securing it at opposite points with artery forceps, was freely opened with scissors in the intervening portion. A flood of meconium immediately covered the field, and continued to flow for some time afterward. In the meantime the parts were constantly irrigated with a douche of warm and weakly carbolized water.

When the intestinal contents ceased flowing the parts were again douched, and the suturing of the mucous membrane to the skin was undertaken. It was now noticed that in consequence of the evacuation of the bowel the tension of the rectal pouch had been entirely relieved, and that with very little effort it could be brought down quite low down in the perineal wound, and sufficiently so as to allow its apposition with the natural anus. The question which then arose was whether the original anal *cul de sac* should be removed and the mucous membrane of the bowel substituted in its place. I decided that I would not disturb the original anus for fear of injuring its sphincter muscles. The rectal pouch was sutured to the proctodeal *cul de sac* in the manner shown in the accompanying diagram. The skin over the sacral region was then closed with a few silk sutures, and the mucous membrane carefully united to the skin immediately behind the anus in the ano-coccygeal region.

This plastic operation would appear to be a very satisfactory

restoration of the continuity of the rectal and anal tract, and leaves a well formed anus, but I have since concluded that it would be preferable, in a similar case, to excise the original mucous lining of the *cul de sac* down to the anal margin completely; paying special attention while so doing to respect all the underlying submucous structures with the view of preserving the functions of the external sphincter and levator ani which has been cut through at its coccygeal attachments by the operation. The objection to leaving the original anus *in situ* is mainly that the interposition of the mucous membrane in its posterior segment is bound to act as a wedge of foreign tissue, which may interfere more or less permanently with the efficient contraction of the sphincter.



FIG. 1—Diagram showing cloaca resulting from anastomosis of proctodeum and mesenteron.

- (1) Peritoneal reflection.
- (2) Mesenteron or rectal *cul de sac*.
- (3) Proctodeum shaded to show line of junction with ampulla of mesenteron.
- (4) Cloaca resulting from suture of enteron and proctodeum.

After the operation the child was washed and soothed by a general immersion in a tub of warm water, after which the parts were dusted with iodoform powder and covered with gauze,

Notwithstanding the extent of the operation the baby's condition was excellent. It kept up a continuous cry at first, but it subsequently intermitted with the less painful manipulations and procedures. After the final bath and dressing it went to sleep very quietly, as if nothing had happened. There was no loss of

blood of any consequence. No vessels were ligated, and the precautions taken to keep the baby warm assisted in diminishing shock.

The next morning, August 30, the temperature rose to 100.2-5 deg. It was noticed that the child coughed occasionally. Next day the cough was more marked without any increase in the temperature. After this the cough continued to increase progressively, much to the baby's distress and to our discouragement until, in a few days, it became evident that the child had contracted whooping-cough.

Locally, the wound progressed most favorably. The bowels moved regularly, there was scarcely any local irritation in the neighborhood of the anal margin notwithstanding the frequent contact of feces.*

The whooping-cough, which was epidemic in the neighborhood at the time, and which thus manifested itself in the baby on the *fourth day* after birth, produced a marked effect on the child's general condition, and threatened the final success of the operation.

The frequent paroxysms of violent cough unquestionably precipitated a complication which would at least not have presented itself so soon after the operation. In consequence of the large pelvic outlet in the sacro-coccygeal region and the laxity of the anal orifice from weak sphincter control, the rectum began to protrude and not many days elapsed before three inches of prolapsed rectum remained constantly extruded from the anus. All attempts to control the escape of the bowel failed. The constant protrusion of the rectal mucosa caused irritation and tenesmus, which distressed the child exceedingly and prevented rest.

None of the local applications had the least influence in preventing the recurrence of prolapse and it became necessary to operate. Having no faith in the palliative operations in such a case, I decided to excise the prolapse. Therefore, on September 20, 1894, twenty-eight days after the first operation and again assisted by Dr. Michinard I amputated three inches of protruding bowel by the following method:

* This was due to the watchfulness of the nurse, whose devotion to her charge contributed largely to the final recovery.

The prolapsed bowel, which was deeply congested, reddish blue in color from anal constriction, was thoroughly washed with warm water, soap and a dilute peroxide of hydrogen solution. Very little chloroform was administered. The protruding bowel was seized with artery forceps at its apex, so as to stretch the prolapse to its utmost. The blades of a long Pean forceps were then introduced at three equidistant points up to the anal margin, one blade within the canal and the other on the outside of it. Before closing the blades the whole prolapsed gut was firmly pressed with the fingers to exclude any coil of small bowel that might be lodged in the procidentia. This was not an unnecessary precaution, for the prolapse had a wide base, and the small intestine could be felt under the mucous membrane. After this the forceps compressed the mucous membrane together, and prevented the further descent of the small bowel. Now, holding the prolapsed mass steadily and preventing its retraction with the forceps, we proceeded to the next step, by which we were to secure the elastic constriction of the bowel at the point of division. A long needle threaded with a double elastic thread was made to transfix the prolapsus at the level closest to the skin, where two elastic threads were tied in a manner to constrict the bowel in two hemisections, thus:

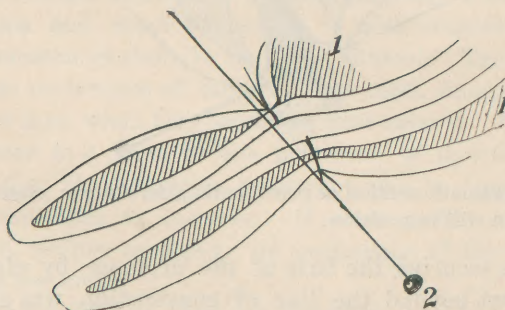


FIG. 2—Section of procidentia recti after Kraske's operation.

(1) Shaded part indicates peritoneal cavity communicating by diverticula with space in prolapse. The small intestine may escape into these spaces if precaution is not taken to prevent this occurrence by means indicated elsewhere.

(2) Fixation pins to hold ligatures and prevent slipping during amputation.

(3) Elastic (sectional) ligatures.

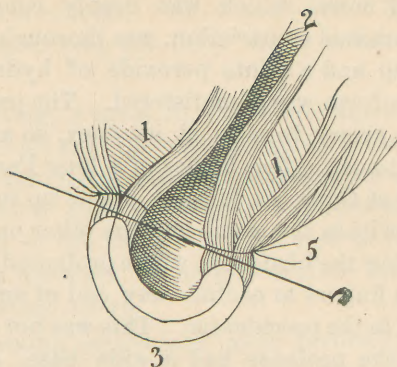


FIG. 3—Diagrammatic section of procidentia recti and method of securing hemostasis and excluding peritoneal infection by fixation pins and elastic sectional ligatures.

- (1) Peritoneal spaces.
- (2) Lumen of bowel.
- (3) Section of prolapsed portion, after amputation.
- (4) Fixation pin.
- (5) Elastic ligatures.

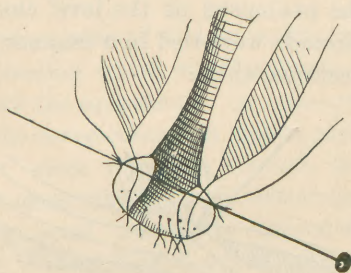


FIG. 4—Diagrammatic section of procidentia after suture; elastic ligature and fixation pin still in position.

After thus securing the base of the prolapse by elastic ligatures, the part beyond the line of constriction was amputated without the loss of a drop of blood, and without danger of injuring any important parts that might accidentally have slipped into the cavities of the prolapse. The elastic constriction also kept the mucous surfaces in perfect apposition and protected the peritoneum from contamination. The mucous membranes were then easily brought together by interrupted silk sutures.*

*The procedure adopted in this case has close analogies with Kleberg's method (*Vide Kelsey's Diseases of the Rectum*, 1896, and *Sajous' Annual*, Section D., p. 22, 1891), though the author was not acquainted with Kleberg's previous application of the principle of elastic constriction before he applied it in this case.

After finishing this operation, we found it necessary to circumcise the child on account of phimosis, which made urination painful.

These operations were followed by no unpleasant consequences, and in ten days the child was entirely well, with the exception of an incipient inguinal hernia which became less troublesome as the cough diminished. It is also worthy of note that, in addition to the anal defects, the phimosis and the disposition to hernia, the child was born a unilateral cryptorchid—one testicle having failed to reach the scrotum.

After this event, the child continued to grow and to do well, though he has always been pale, fretful, and not as vigorous as his other little brothers. Last summer, or about a year and a half after the operation, the baby was brought to the city, and I had the opportunity of examining it.

The child had normally three or four bowel movements a day. It was difficult to ascertain whether there is much bowel control, but the finger feels a certain amount of resistance and contraction when it is introduced a short distance beyond the anal margin. The baby appears to be disposed to frequent diarrheal and dysenteric attacks, which are probably due to digestive disturbances. When these occur, the anal region becomes irritated, and has to be most carefully watched to prevent eczema and excoriations. It is also noticed that under these circumstances there is no fecal control. There is also a tendency to recurrence of the prolapsus recti, though in a much less degree than when this condition first existed. The prolapse now appears to be due to the tenesmus of dysentery. It is probable that the operative treatment will be required if the prolapse continues to increase. If such is the case, I shall advocate a simple rectopexy or anchoring of the rectum by Verneuil's method.

While the child has thus far survived, and is apparently in very fair condition, it is evident that it has had to travel over a very hard road, and that its future path is not likely to be strewn with roses.

COMMENTARY.—After a careful investigation of the literature of the subject, I find that this is the tenth in a list of twelve cases of ano-rectal imperforation in which relief has been attempted by Kraske's method or its modifications. The cases

are reported by Vincent of Lyons, two cases, in 1887; Ceci, of Genoa, 1890; Burrell, Boston, 1891; Chaput, Paris, 1892; Poisson, Nantes, 1892; Czerny, Heidelberg, 1893, two cases; Fochier, Lyons, 1894; the present case, New Orleans, 1894; Elliott, Boston, May, 1896; W. W. Keen, Philadelphia, December, 1896. Of the twelve cases reported only two succumbed to causes directly connected with the operative treatment; and in one of these death was caused by peritonitis due to the infection of the peritoneum with an exploring needle previous to the sacral operation (Czerny's second case).

Eight out of the twelve cases died at variable periods, from a few days to two months after the operation, from diarrhea, marasmus, capillary bronchitis, and other conditions not directly connected with the operation.

Four of the twelve cases had survived up to the time when they were reported. In Burrell's case, four and a half years after operation; in Poisson's, three years; in the writer's case, two years and nine months; in Elliott's case, six months after the operation. The relations of Kraske's operation to other operative measures intended for the relief of imperforate infants are fully discussed in a paper which the writer has contributed to the transactions of the Second Pan American Congress held in Mexico City, November, 1896.

